Cancer screening in older adults and its limits

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No relevant conflicts of interest to disclose

Learning objectives
• To review goals of cancer screening programs
• To review why cancer screening is of diminishing value with advancing age
• To discuss an approach to when and how to discuss cancer screening cessation with older adults

Outline
• General considerations for cancer screening
• What about older adults?
• Cancer screening guidelines
• Stopping cancer screening – when and how
• Summary

Outline
• General considerations for cancer screening

General considerations for cancer screening in older adults

• Screening asymptomatic individuals to detect early cancers which may be curable
• Use diagnostic tests with high sensitivity
• Natural history of disease can be changed by intervention
• Benefits outweigh risks
Benefits of screening
- Picks up early stage, curable disease
- Prolonged survival
- Better quality of life
- Self-empowerment
- Often economically attractive

Harms of screening
- Anxiety surrounding diagnosis/work-up
- Labelling phenomenon
- Procedural risks
- False positives/false negatives
- Identifying clinically insignificant lesions (e.g. DCIS, Gleason 6 prostate cancer)
- Economic considerations

Outline
- General considerations for cancer screening
- What about older adults?

What about older adults?
- Benefits diminish with age
  - Competing risks of mortality from comorbid conditions and advancing age
- Harms may increase
  - Procedural risks may increase with age for screening tests or subsequent treatments (e.g. perforation rates with colonoscopy, peri-op mortality and morbidity for major cancer surgery)

Why should oncologists care?
- Often providers of preventive services of second primaries and other survivorship health issues
- Advocates for optimal care for older adults
- Experts in geriatric oncology
Are we overscreening?

- Multiple (mostly US) studies suggest overscreening is common
- 31-55% of 27,404 adults age 65+ in US with very high mortality risk (>75% 9-year) received cancer screening

Royce TJ. JAMA Intern Med 2014; 174:1558

Outline

- General considerations for cancer screening
- What about older adults?
- Cancer screening guidelines

Cancer screening guidelines

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<thead>
<tr>
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<tbody>
<tr>
<td>Breast</td>
<td>CBE &amp; Mammogram yearly after age 40, every 2 y after 55 until &lt;10 y life expectancy</td>
<td>CBE &amp; Mammogram every 1-2 y age 50-69</td>
<td>Mammogram every 2 y age 50-74</td>
</tr>
<tr>
<td>Cervical</td>
<td>Pap every 2-3 y until age 65*</td>
<td>Pap every 3 y until age 69*</td>
<td>Pap every 3 y until age 69*</td>
</tr>
</tbody>
</table>

ACS = American Cancer Society; CTFPHC = Canadian Task Force on Preventive Health Care; USPSTF = US Preventive Services Task Force; CBE = Clinical breast exam
* - if ≥ 3 prior Pap smears were normal

Cancer screening guidelines

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<tbody>
<tr>
<td>Colorectal</td>
<td>Age 50+ either FOBT yearly OR flex sig every 5 y OR colonoscopy every 10 y OR DCBE every 5 y</td>
<td>Age 50+ FOBT every 1-2 y +/- flex sig (interval not specified)</td>
<td>Age 50-75 FOBT yearly +/- flex sig every 5 y OR colonoscopy every 10 y</td>
</tr>
<tr>
<td>Prostate</td>
<td>DISCUSS annual PSA + DRE age 50+ if life exp. &gt;10 y</td>
<td>Not routinely recommended</td>
<td>DISCUSS after age 50 if life exp. &gt;10 y</td>
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FOBT = Faecal occult blood test; DCBE = Double contrast barium enema; PSA = Prostate-specific antigen; DRE = digital rectal exam

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<td>Lung</td>
<td>Low-dose CT annually age 55-74 among smokers 30 pack-years quit &lt;15 y ago</td>
<td>Low-dose CT annually age 55-74 among smokers 30 pack-years quit &lt;15 y ago</td>
<td>Low-dose CT age 55-80 among smokers</td>
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Moving beyond the guidelines

- Key principles in moving beyond existing evidence and/or guidelines
- Need to know 2 things:
  - How long do people have to live to reap benefits of screening
  - Remaining life expectancy of the patient
Step 1: Predicting life expectancy

- Eyeball test (‘exam room table test’)
- Age (Actuarial life tables)
- Adding comorbidity
- Validated prediction tools
- ePrognosis

Can they get on and off the table?

ePrognosis

- eprognosis.ucsf.edu
- Incorporates both Schonberg and Lee indices in convenient on-line format, both authors are collaborators in designing the website

** App available **

Step 2: Time to benefit

- For most of these cancers, typical LEAD TIME before benefits are predictably seen is 10 years (although may be closer to 5-7 years for breast cancer)
- Risks, however, are mainly up front (diagnostic work-up and treatment-related)
Outline

• General considerations for cancer screening
• What about older adults?
• Cancer screening guidelines
• Stopping cancer screening – when and how

Cancer screening – when to stop?

• Screening asymptomatic individuals to detect early cancers which may be curable
• Use diagnostic tests with high sensitivity
• Natural history of disease can be changed by intervention
  • Benefits outweigh risks

Barrier to discussing stopping screening

– Patients have highly favourable views of screening
  • Screening equated with health and life
– Limited time to discuss with PCP
– Some would seek second opinion or question physician’s recommendation to stop but others place great value on trusted doctor’s recommendations
– Distrust of experts, gov’t panels, and payers
– Many do not believe LE estimation reliable

Facilitators to discussing stopping screening

– Poor health or burden on others often motivated
– Advanced age (but threshold varied from 65-100)
– Incorporating health and functional status personalizes doctor-patient care and preferred
– Use phrase “This test would not help you live longer” instead of “You may not live long enough to benefit from this test”
– However, how best to discuss stopping not clear

Stopping screening – how to do it?

• Step 1: Ensure your patient is up to date with guideline-based screening
• Step 2: Start thinking about discussing stopping screening when the patient reaches age 70-75 or has moderate comorbidities
• Step 3: Be comfortable with general guidelines, risk factors, and a sense of timeframe for benefits (e.g. 10-15 life expectancy years for prostate cancer)
Stopping screening – how to do it?

• Step 4: Normalize the discussion and use positive language
  – 'Once patients reach a certain age and level of health and function, the risks and benefits of different medical procedures change, and it's good to reassess things'
  – 'Lots of patients stop getting screened at a certain point because the test is unlikely to help them live longer'

• Step 5: Know your patient's motivations to be screened, and think of barriers and facilitators

• Step 6: Anticipate objections

• Step 7: Emphasize shared decision-making and respect the patient's wishes

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Summary

• Benefits of cancer screening diminish with increasing age and harms increase, but many factors beyond age influence life expectancy and need to be considered
• Stopping cancer screening requires effort but is important to reduce harm (and waste) and can be aided by knowledge, LE prediction tools, and a structured approach, particularly as lead time for benefits is usually 10 years or longer

Acknowledgements

• Dr. Anne Horgan (Ireland)
• Dr. Dan Yokom (Canada)
Supplemental materials
Cancer screening in older adults:
What does the evidence say?

What does the evidence say?
- Breast Cancer
  - 8 RCTs of mammography and/or clinical breast exam
  - 26% reduction (95% CI 17-34%) in breast cancer mortality with mammography among 50-69 year old women
  - 2 RCTs included women age 50-74, but too few women age 70+ for subgroup analyses
  - Self-breast examination not shown to reduce breast cancer mortality in RCTs

Benefits of screening seen after 5-7 years of follow-up
With aging, breast density changes because glandular tissue is replaced by fat, leading to slightly improved sensitivity of mammography
However, increased DCIS and false positive mammograms with aging

What does the evidence say?
- Cervical Cancer
  - No RCTs of benefit in any age group
  - Strong evidence of survival benefit from cohort and case-control studies
  - No studies specifically looking at benefits in age 70 or older BUT developing cervical cancer rare among previously screened women age 70 or older
  - Unclear how soon benefits seen with follow-up

Impact of vaccine not clear on screening approaches as well as durability of vaccine protection
45-60% of Canadian women age 60-69 have not had Pap smear in last 3 years (1998 Surveillance Report, PHAC)
What does the evidence say?

**Colorectal Cancer**
- Multiple screening manoeuvres
- Best evidence for FOBT – 17-20% reduction in incidence and 15-33% reduction in colorectal cancer mortality
- No large RCTs demonstrating mortality benefit of either flexible sigmoidoscopy, colonoscopy, or double-contrast barium enema

What does the evidence say?

**Colorectal Cancer**
- Increased rate of complications (including perforation) from flex sig or colonoscopy with increasing age
- RCTs included people up to age 79-85
- Benefits of screening seen after 5-10 years of follow-up

What does the evidence say?

**Colorectal Cancer**
- FOBT may be less specific and more sensitive in older adults due to prevalent diverticular disease
- Increased rate of complications (including perforation) from flex sig (baseline rate 1:10,000) or colonoscopy (1:3,000) with increasing age
- RCTs included people up to age 79-85
- Benefits of screening seen after 5-10 years of follow-up

What does the evidence say?

**Prostate Cancer**
- Most controversial of all major cancer screening manoeuvres
- 2 large RCTs published in March 2009, came to differing conclusions about benefits but risks of overdetection similar and high in both studies as many tumours are indolent
- Treatment often associated with long-term side effects (urinary and sexual dysfunction)

Prostate cancer screening

**Andriole et al.**
- US study of 76,693 men age 55-74
- Recruited from 1993-2001
- PSA annually for 6 y and DRE for 4 y
- No per-protocol biopsy or treatment mandated; info on screening results sent to GP
- Primary outcome was cause-specific mortality
- Median follow-up 11.5 y

Prostate cancer screening

**Andriole et al.**
- More prostate cancer diagnoses in screened group (rate ratio 1.22, 95% CI 1.16-1.29)
- Similar advanced tumours in 2 groups
- Slightly higher death rate in screened group (rate ratio 1.13, 95% CI 0.76-1.70)
- No advantage of screening in any subgroups
- Compliance 85-86% for screening but 49-52% in control group

Prostate cancer screening

- Schroder et al.
  - European study of 162,243 men ages 55-69 y
  - Complex study with slightly different protocols in each of 7 countries
  - PSA screening every 4 y
  - Protocol-mandated biopsy if PSA ≥ 3 ng/mL
  - Treatment as per local guidelines
  - Cause-specific mortality primary outcome
  - Median follow-up 9.0 y


Prostate cancer screening

- Schroder et al.
  - Cumulative incidence of prostate cancer of 8.2% in screened and 4.8% in control group
  - Lower rate of aggressive tumours in screened pts (24% vs 45%)
  - Absolute difference in prostate cancer deaths of 0.71 per 1,000 men screened (NNS = 1,410) in favour of screening (rate ratio 0.80, 95% CI 0.67-0.95)
  - Rates diverged after 7-8 y


What does the evidence say?

- Prostate Cancer
  - Sensitivity and specificity of PSA test and digital rectal exam poor
  - Only one RCT demonstrated that treatment reduces prostate cancer mortality
  - If one starts screening younger men, when to stop?
    - benefits of early treatment from 1 RCT were seen after 8 years BUT 90% had palpable disease (7-12 years of lead time with) PSA-detected tumours